

SN: 10/719,426  
Docket No. S- 100,556  
In Response to Office Action dated September 20, 2005

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**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

**Claim 1 (original):** A through-the-earth communication system comprising:

an audio signal input device;

a transmitter operating at a predetermined frequency sufficiently low to effectively penetrate useful distances through-the earth, and having an analog to digital converter receiving said audio signal input and passing said audio signal input to a data compression circuit whose output is connected to an encoding processor, said encoding processor output being provided to a digital to analog converter;

an amplifier receiving analog output from said digital to analog converter for amplifying said analog output and outputting said analog output to an antenna;

a receiver having an antenna receiving said analog output and passing said analog output to a band pass filter being connected to an analog to digital converter that provides a digital signal to a decoding processor whose output is connected to an data decompressor, said data decompressor providing a decompressed digital signal to a digital to analog converter; and

an audio output device receiving analog output form said digital to analog converter for producing audible output.

**Claim 2 (original):** The apparatus as described in Claim 1 wherein said audio signal input device is a microphone.

**Claim 3 (original):** The apparatus as described in Claim 1 wherein said antenna is a loop antenna.

**Claim 4 (original):** The apparatus as described in Claim 1, wherein said encoding processor operates using quadrature phase shift keying.

**Claim 5 (original):** The apparatus as described in Claim 1, wherein said encoding processor operates using a QAM-16 processor.

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Claim 6 (original): The apparatus as described in Claim 1, wherein said predetermined frequency is approximately 7 kHz.

Claim 7 (original): The apparatus as described in Claim 1, wherein said predetermined frequency is approximately 4 kHz.

Claim 8 (original): The apparatus as described in Claim 1, wherein said band pass filter is of the wideband 4-pole elliptic design.

Claim 9 (original): The apparatus as described in Claim 1, wherein said antenna is a SQUID detector connected to a flux locked loop.

Claim 10 (original): A through-the-earth communication system comprising:  
a digital signal input device;  
a transmitter operating at a predetermined frequency sufficiently low to effectively penetrate useful distances through-the earth, receiving said digital signal input and providing said digital input signal to a data compression circuit that is connected to an encoding processor;

an amplifier receiving encoded output from said encoding processor for amplifying said encoded output and outputting said encoded output to an antenna;

a receiver having an antenna receiving said encoded output followed by a band pass filter being connected to a decoding processor whose output is connected to an data decompressor, said data decompressor providing a decompressed digital signal.

Claim 11 (original): The apparatus as described in Claim 10, wherein said digital signal input device is a digital video camera.

Claim 12 (original): The apparatus as described in Claim 10, wherein said antenna is a loop antenna.

Claim 13 (currently amended): The apparatus as described in Claim 10, wherein said encoding processor operates using quantum quadrature phase shift keying.

Claim 14 (original): The apparatus as described in Claim 10, wherein said encoding processor operates using a QAM-16 processor.

Claim 15 (original): The apparatus as described in Claim 10, wherein said predetermined frequency is approximately 4 kHz.

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Claim 16 (original): The apparatus as described in Claim 10, wherein said predetermined frequency is approximately 7 kHz.

Claim 17 (original): The apparatus as described in Claim 10, wherein said band pass filter is of the wideband 4-pole elliptic design.

Claim 18 (original): The apparatus as described in Claim 1, wherein said antenna is a SQUID detector connected to a flux locked loop.

Claim 19 (original): A method of conducting through-the-earth communication comprising the steps of:

inputting an analog signal;

digitizing said analog signal;

compressing said digitized signal;

encoding said compressed digitized signal to encode a predetermined data stream into said compressed digitized signal; and

outputting said encoded compressed digitized signal through an antenna at a predetermined frequency that is sufficiently low to effectively penetrate useful distances through-the-earth as a transmitted signal;

receiving said transmitted signal with an antenna after said transmitted signal has propagated through-the-earth;

converting said transmitted signal from an analog signal to a digital signal;

decoding said digital signal;

decompressing said digital signal; and

outputting said decoded decompressed digital signal.

Claim 20 (original): The method as described in Claim 19, where said antenna comprises a SQUID detector followed by a flux locked loop.

Claim 21 (original): The method as described in Claim 19, wherein said step of outputting said decoded decompressed digital data further comprises outputting to a speaker.

Claim 22 (original): The method as described in Claim 19, wherein said step of outputting said decoded decompressed digital data includes outputting an audio signal.

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Claim 23 (original): The method as described in Claim 19, wherein said step of inputting an analog signal is accomplished by use of a microphone.

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